REMARKS

Claims 1, 10 and 20 are amended and new claims 21 and 22 are presented herewith. Claims 1-22, as amended, remain in the application with Claims 3-8 and 13-18 withdrawn. No new matter is added by the amendments to the claims.

The Rejections:

In the Office Action dated January 31, 2007, the Examiner rejected Claims 1, 2, 9-12, 19, and 20 under 35 U.S.C. 103(a) as obvious over Huang et al. 6,286,656. The Examiner stated that Huang discloses a method for stacking cases on a pallet per claimed invention. The method comprises the steps of: supplying cases to a buffer 16 in a random order (at least column 8, second full paragraph); defining stacking rules or stacking principles for selecting cases from the buffer to be placed on respective pallet; organizing the rules in a predetermined order (at least column 8, second full paragraph); determining physical characteristics of cases in the buffer including dimensions of a case base and case height; determining available locations on the pallet where a case in the buffer can be placed (at least column 8, lines 33-67); using physical characteristics of cases in the buffer and applying the stacking rules to at least a portion of the buffer cases; identifying a selected buffer case that satisfies at least one of the rules and a corresponding position on the pallet for the selected case; and using an industrial robot 17 (Figure 1) to place the selected case on the pallet at the corresponding position. The Examiner states that it is at least obvious, if not inherent, that at least for the first few packages to be placed on Huang et al. pallet, the cases that instantly met the rules do not need to be reordered and are placed on the pallet before the identification of a subsequent case.

The Examiner further stated that the Huang method comprises:

reapplying the previously determined stacking principle (i.e. corner-fit) before applying another stacking principle to a buffer case (i.e. stability-fit);

method step of determining available positions on the pallet by continually updating available regions on the pallet where a buffer case can be placed as cases are placed on the pallet. Huang et al. '656 continually replenishes the buffer 20 with cases after a buffer case is placed on the pallet;

applying the stacking rules sequentially in a variable prioritized order (i.e. corner-fit first and stability-fit) to at least a portion of the buffer cases and the available locations;

repeatedly applying the rules in a variable prioritized order to the buffer cases, repeatedly selecting for placement on the pallet a case that satisfies a stacking rule, repeatedly placing each case on the pallet in the corresponding location until the platform is filled with cases, supplying an unfilled pallet 11, and continually replenishing the buffer 16 with cases after a buffer case is placed on the pallet; and

identifying physical characteristics of at least one case in the pallet including the case height, identifying one of the pallet cases having a case height equal to a case height of a selected buffer case and a corresponding position adjacent the one pallet case for the selected case, and using an industrial robot to place the selected case on the pallet.

The Examiner rejected Claims 1, 2, 9-12, 19, and 20 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Van Durrett et al. 5,501,571. The Examiner stated that Van Durrett discloses a method for stacking cases on a pallet per claimed invention. The method comprises the steps of: supplying cases to a buffer 20 in a random order (column 1, lines 30-45); defining rules for selecting cases from the buffer 20 to be placed on respective pallet (full layer rule, height/weight rules for stability, and/or exception case rule); determining physical characteristics of cases in the buffer including dimensions of a case base and case height; determining available locations on the pallet where a case in the buffer can be placed (Figures 7-24); using physical characteristics of cases in the buffer and applying the rules to at least a portion of the buffer cases; identifying a selected buffer case that satisfies at least one of the rules and a corresponding position on the pallet for the selected case; and using an industrial robot 90 to place the selected case on the pallet at the corresponding position (Figures 7-24). The Examiner states it is at least obvious, if not inherent, that at least for the first few packages to be placed on Van Durrett et al. pallet, the cases that instantly met the rules do not need to be reordered and are placed on the pallet before identification of a subsequent case.

In regards to Claim 2, the Examiner stated that the Van Durrett method further comprises reapplying the previously determined rule (i.e. weight rule control loop) before applying another rule to a buffer case.

In regards to Claim 9, the Examiner stated that the Van Durrett method step of determining available positions on the pallet further comprises continually updating available regions on the pallet where a buffer case can be placed as cases are placed on the pallet; and

continually replenishing the buffer 20 with cases after a buffer case is placed on the pallet (Figure 1A).

In regards to Claim 10, the Examiner stated that the Van Durrett method further comprises applying the rules sequentially in a variable prioritized order (i.e. heavy cases first) to at least a portion of the buffer cases and the available locations.

In regards to Claim 11, the Examiner stated that the Van Durrett method further comprises repeatedly applying the rules in a variable prioritized order to the buffer cases; repeatedly selecting for placement on the pallet a case that satisfies a rule; and repeatedly placing each case on the pallet in the corresponding location until the platform is filled with cases; supplying an unfilled pallet 99; and continually replenishing the buffer 20 with cases after a buffer case is placed on the pallet (Figure 1 A).

In regards to Claim 12, the Examiner stated that the Van Durrett method further comprises reapplying the previously determined rule (i.e. weight rule control loop) before applying another rule to a buffer case.

In regards to Claim 19, the Examiner stated that the Van Durrett method step of determining available positions on the pallet further comprises continually updating available regions on the pallet where a buffer case can be placed as cases are placed on the pallet.

In regards to Claim 20, the Examiner stated that the Van Durrett method further comprises determining physical characteristics of at least one case in the pallet including known case height (height dimension of the case as it is being loaded on the pallet and the maximum allowable height for each layer of cases on the pallet); identifying a pallet cases having a case height equal to a case height of a selected buffer case and a corresponding position adjacent the one pallet case for the selected case; and using an industrial robot to place the selected case on the pallet (Figures 15, 21).

The Response:

Applicants amended the claims to more clearly define their novel invention. Specifically, Applicants amended independent claims 1, 10 and 20 and added new claims 21 and 22 for consideration by the Examiner.

Applicants repeat their request made in response to the previous office action based on 37 CFR 1.104(c) (2) which states that in rejecting claims for want of novelty or for obviousness, the

Examiner must cite the best references at his or her command and, when a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The Huang patent includes 117 drawing figures and 52 columns of description. Except for the "supplying" and the "determining available locations" steps of Claim 1, the Examiner failed to identify any particular part of Huang relied upon for the rejection of the other method steps of Claims 1, 2, 9-12, 19, and 20. Therefore, the following remarks are based upon Applicants' "best guess" as to the parts of Huang relied upon by the Examiner.

Neither Huang, nor Van Durrett teach or claim the random system now more clearly defined by Applicants in the claims presented where the end result is always placing a case on a pallet. Both Huang and Van Durrett perform mapping based on a fixed decision tree without placing a case on a pallet.

Applicants' invention teaches and now more clearly claims the use of various methods in a priority sequence to choose a case, or series of cases, for placement on a pallet. (Specification page 3, lines 14-15). Regions are used to define the currently available places to place cases on the pallet and insure stability. (Spec. page 3, line 16 and page 4, lines 8-24). Each case is randomly located on a buffer conveyor and is individually evaluated for potential placement in available unfilled regions. Individual case evaluation is based on the priority sequence and regions available. The priority sequence includes stability criterion. A case must meet the criteria for the highest priority in a sequential priority sequence and the stability criterion to be selected for placement on a pallet. If none of the cases in the buffer meet both criterions, then a subsequent priority in the sequential priority sequence is applied and with the stability criterion for that priority, determines if a case meets the new criterion for placement on a pallet. The sequential priority sequence with the corresponding stability criterion is applied until a case is placed on a pallet. Thus, the end result is that a case is placed on a pallet.

Unlike the prior art cited, there is no set of programmed regions or preset placement maps from which to choose the best region or placement of the group of buffered cases; there is no qualifying, no queuing, and no mapping. Instead, each case is evaluated based on a prioritized sequence and updated regions. Each prioritized sequence combines variable parameters resulting in a case being placed on a pallet- NOT QUALIFYING each case to be placed on a mapped pallet.

The Examiner rejected Claims 1, 2, 9-12, 19, and 20 under 35 U.S.C. 103(a) as obvious over Haung. Huang et al. bases all subsequent package placement decisions on corner locating. In Huang, each package is weighed and measured before passing onto the queuing/buffer conveyor. The measured package data is stored in the computer and stacking algorithms search for the best placement plan for the measured data. The choice of placement plans is made from a set of programmed placement plans. Once a preprogrammed placement plan is chosen, then the placement plan dictates which package qualifies to fit within this plan. The qualified package is then picked from the buffer conveyor and placed on the pallet. (Col. 11, lines 4-25). The placement plans are preset and the order of picking up the packages is predetermined. While the gripper may randomly pick up any package from the buffer conveyor, as in not necessarily having to pick up the package next in line, the choice of which package to pick up is predetermined based on a predetermined plan from a definitive set of plans from which to choose. (Col. 12, lines 11-24). And see, Col. 26, lines 64-67 and Cols. 27 and 28 which describe the "placement evaluator" – where each package is given a performance level from which a placement scheme is determined and either qualifies or does not. If the package qualifies, then the package is placed in the predetermined order on the pallet.

The Examiner rejected Claims 1, 2, 9-12, 19, and 20 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Van Durrett. Like Huang, Van Durrett relies on measured factors that result in a pre-determination of the layout of the pallet and the qualifying packages that fit the layout. This is accomplished by providing queues. Queuing is necessary where predetermined heavy boxes are placed on the bottom and predetermined light boxes are preferably placed on top using a partition scheme chosen from several known partition schemes provided. (Col. 2, lines 36-48) Van Durrett positions a case in the map based upon satisfying several decisions, but that case can be moved in the map prior to the pallet loading sequence being organized. It is only after all the cases have qualified and have been mapped that the cases are placed on the pallet. Therefore, Van Durrett does not place a selected buffer case on the pallet before identifying another buffer case. Further, Van Durrett does not teach or suggest a stability factor; rather, the layer orientation is simply switched around. (Col. 2, lines 49-57).

The Examiner stated that Applicants' argument that Van Durrett does not anticipate the instant claims because the claimed invention does not reorder cases on the conveyor per Van

Durrett is not persuasive and urges that Van Durrett still anticipates the claims per the current rejection set forth above.

It is the Examiner's position that the Van Durrett method of choosing locations for a box per various partitions plans is interpreted as including configurable rules. The Examiner stated that as each decision is being made, it would have to abide by a set of rules. The Examiner states that Applicants' claim language does not provide any specific distinction among the claimed rules and those of Van Durrett.

Applicants amended Claims 1 and 10 to clarify the step of "identifying a selected buffer case that satisfies any one of the rules". Applicants' rules are organized in a control algorithm for serial execution by the computer and application in a predetermined order, each rule being designed to address a particular aspect of producing a stable, compact stack of palletized cases. Rather than make the same decision by evaluating various factors during each execution of the control algorithm, each rule was designed to evaluate a unique condition that might arise. For example, the Full Layer rule evaluates whether a number of cases are available in the buffer and a single flat surface is available and whether an interlocked pattern can be made. In this manner, a pattern can be generated that covers the available space and leaves a new flat surface for subsequent cases. Each rule was designed to maximize the use of the pallet while maintaining stability. The priority of the rules determines the order in which the conditions are checked. (See Page 7, Lines 7-17; Fig. 2) When a case satisfies any one of the rules (step **54** in Fig. 2) and a corresponding position is found (step **56** in Fig. 2), the selected case is placed on the pallet (step **60** in Fig. 2).

The Examiner identified the Van Durrett rules as including a "full layer rule", "height/weight rules for stability" and/or an "exception case rule". Van Durrett does not use the term "rule" and the Examiner failed to identify any particular part of Van Durrett relied upon for the rejection.

Van Durrett shows in Figs. 7-24 logic/flow diagrams for building a new pallet. The pallet building process includes numerous decisions and uses partition plans which are described as a method of breaking the pallet into two sections and mapping boxes onto each section. The maps are changed as to the best loading sequence and optimal location on the pallet as each carton on the conveyor is located, weighed and measured.

In view of the amendments to the claims and the above arguments, Applicants believe that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.